UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/559,073	04/27/2000	Kazuyuki Murakami	0059-1219-0X	2052

22850 7590 05/30/2003

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
VANOY, TIMOTHY C	
ART UNIT	PAPER NUMBER
1754	21

DATE MAILED: 05/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/559,073	MURAKAMI et al.
Examiner	**Group Art Unit**
VANOY	1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE ——MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to ~~communication(s) filed on~~ THE AMENDMENT DATE-STAMPED AUG. 22, 2002; THE PRELIMINARY COMMENTS AND 1.132 DECLARATION DATE-STAMPED MAY 15, 2003.

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 17-24, 31-33 AND 38-49 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 17-24, 31-33 AND 38-49 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Notice of Reference(s) Cited, PTO-892

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Interview Summary, PTO-413

☐ Notice of Informal Patent Application, PTO-152

☐ Other _____

Office Action Summary

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

The request date-stamped April 11, 2003 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09-559,073 (paper no. 18) is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person "having ordinary skill in the art" has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 17-24, 31, 38 and 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 06-216,446 in view of JP 4-175,277 A ("JP-277").

The English abstract of JP 06-216,446 discloses what appears to be at least an obvious variation of the same carbonaceous material (and method for making the same) and the same electric double layer capacitor (and method for making the same).

The carbonaceous material was prepared by:

(i) curing a phenolic resin;

(ii) grinding the cured product;

(iii) carbonizing the ground, cured product via thermal treatment in a nitrogen atmosphere, and

(iv) activating the carbonized product in an atmosphere of carbon dioxide to (evidently) obtain the carbonaceous material (please see the English abstract of JP 06-216,446, under the first two sentences under the "Constitution" paragraph header).

This activated carbonaceous material is mixed with other ingredients to include the binder of Applicants' claim 38 and worked up to (evidently) form the capacitor (please see the English abstract of JP 06-216,446, the last three sentences under the "Constitution" paragraph header).

The difference between the Applicants' claims and JP 06-216,446 is that Applicants' claim 38 step (1) calls for curing the resin in the presence of a *volatile component* (wherein pg. 16 lns. 11-21 in the Applicants' specification defines *volatile component* as embracing compounds to include glycols, polyols such as ethylene glycol, etc.).

The English abstract of JP 4-175,277 A describes a method for curing phenolic resin (evidently, the same phenolic resin of JP 06-216,446 and also of Applicants' claim 42) in a process for making an electric double layer capacitor (please compare to the "electrostatic capacitance" mentioned in the English abstract of 06-216,446 and also to the "electric double layer capacitor" of Applicants' claims 31-33 and 38-43) wherein a "glycerol" or an "oxyalkylene compound" (the same polyethylene glycol embraced in the scope of compounds mentioned on pg. 16 lns. 11-21 in the Applicants' specification is *also* set forth in Tables 1 and 2 on pg. 14 in the text of JP 4-175,277 A, i. e. the "PEG") is added to the phenolic resin prior to the carbonization of the resin. The "use/advantage" section of the English abstract of JP 6-175,277 A sets forth that the product carbon composition has a high surface area (Table 3 on pg. 16 mentions a surface area as high as 1200 m2/g, please compare this to the surface area of 1,000 to 2,500 m2/g set forth in (at least) Applicants' claim 17), liquid permeable pores (Table 3

mentions a pore volume as high as 0.56 g/cm3, please compare this to a pore volume of 0.5 to 1.5 cm3/g set forth in at least Applicants' claim 17) and is suitable for stably functioning capacitors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process of JP 06-216,446 A *by including* the "glycerols" or "oxyalkylene compounds" (i. e. "PEG", etc.) mentioned in the English abstract of JP 04-175,277 *with the* phenolic resin at a point in the process before the carbonization step, in the manner required by at least Applicants' claim 38, *because* of the expected advantage of obtaining a surface area and porosity of the carbon product that renders it suitable for use in electric double layer capacitors (please see the "use/advantage" section in the abstract of JP 4-175,277 A), *in the same field of endeavor as in the Applicants' claims.*

The surface area limitations of Applicants' claims 17, 21, 22, 24, 31 and 43 are noted, but the composition manufactured according to the above process resulting from the modification of JP 6-216,446 according to JP 4-175,277 is expected to exhibit surface areas that are indistinct, since the process for preparing the composition is indistinct. For example, Table 3 on pg. 16 in JP 4-175,277 mentions a surface area as high as 1200 m2/g, please compare this to the surface area of 1,000 to 2,500 m2/g set forth in (at least) Applicants' claim 17.

The porosity limitations of Applicants' claims 17-20, 23, and 43 are noted, but the composition manufactured according to the above process resulting from the modification of JP 6-216,446 according to JP 4-175,277 is expected to exhibit porosities

that are indistinct, since the process for preparing the composition is indistinct. For example, Table 3 on pg. 16 in JP 4-175,277 mentions porosities as high as 0.56 g/cm3, please compare this to the porosity of 0.5 to 1.5 cm3/g set forth in (at least) Applicants' claim 17.

The difference between the Applicants' claims and the English abstract of JP 06-216,446 is that (at least) Applicants' claim 38 describe temperature; viscosity and mass reduction limitations used in the process for making the carbonaceous material and capacitor, however it is submitted that these differences would have been obvious to one of ordinary skill in the art at the time the invention was made *because* it is submitted to be within the skill level of the person having ordinary skill in the art *to readily determine* which process parameters (i. e. the claimed temperature limitations, etc.) should be used from the general conditions that JP 06-216,446 and JP 4-175,277 A use to make their carbonaceous material and capacitor *and to also describe* the chemical and physical properties of what appears to be the same carbonaceous material and capacitor.

Claims 17-24, 31 and 38-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over the English abstract of JP 06-216,446 in view of JP 4-175,277 A and further in view of JP 5-243,092 A and JP 2-297,915 A.

Claims 17-24, 29-31, 38 and 42-43 are rejected as being obvious from the English abstract of JP 06-216,446 in view of JP 4-175,277 A, as described in the previous rejection.

The differences between the Applicants' claims and JP 06-216,446 is that Applicants' claims 26-28 and 39-41 call for the use of curing agents and curing accelerators to be used during the curing of the resin.

The English abstract of JP 2-297,915 A is drawn to the same art of making electric double layer capacitors and discloses the use of a curing agent during the curing of the phenol resin. The English abstract of JP 5-243,092 A is also drawn to the same art of making electrolytic capacitors and discloses the use of salicylic acid as an agent which shortens the aging time of components used in the manufacture of electrolytic capacitors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process of making the carbonaceous material obvious from the English abstract of JP 06-216,446 in view of JP 4-175,277 A *by including* the curing agents and/or curing accelerators disclosed in the English abstracts of JP 2-297,915 A and JP 5-243,092 A in the claimed amounts during the curing step, in the manner called for in at least Applicants' claims 26-28 and 39-41, *because* the disclosures set forth in the English abstracts of JP 2-297,915 A and JP 5-243,092 A is evidence that it is conventional and the status quo to use such curing agents and curing accelerators in the manufacture of capacitors. It is obvious to do what is routinely done in the art.

Claims 17-24, 31, 32, 33, 38-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over the English abstract of JP 06-216,446 in view of JP 4-175,277 A and

further in view of JP 2-297,915 A and JP 5-243,092 A, as applied to claims 17-31 and 34-43 above, and further in view of U. S. Pat. 5,754,393 to Hiratsuka et al.

The difference between the Applicants' claims and JP 06-216,446; JP 4-175,277 A; JP 2-297,915 A and JP 5-243,092 A is that Applicants' claims 32 and 33 call for the presence of an organic electrolytic solution comprising a solvent, such as sulfolane, sulfolane derivatives, etc., and a quaternary onium salt in the capacitor.

Col. 2 ln. 8 to col. 3 ln. 10 in U. S. Pat. 5,754,393 discloses a capacitor containing an electrolyte which comprises a solvent (such as sulfolane and its derivatives: please also see col. 2 lns. 35-34) and a quaternary onium salt (please see col. 2 lns. 62 to col. 3 ln. 10). From the description of the prior art set forth in col. 1 lns. 9 et seq., it appears conventional to use such electrolytic salts and solvents in the art of manufacturing capacitors, and the particular solvents and salts set forth in the Applicants' claims appear to also be conventional in the art (please note col. 1 lns. 35-42 and col. 2 ln. 63 to col. 3 ln. 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to recite* that the electric double layer capacitor obvious from the English abstract of JP 6-216,446 in view of JP 4-175,277 A also contains an electrolyte (to include the solvent and electrolytic salts of Applicants' claims 32 and 33) *because* the description of the prior art set forth in col. 1 lns. 9 et seq. in U. S. Pat. 5,754,393 is evidence that the presence of such electrolytes in electric double layer capacitors is conventional and the state of the art for the taught advantage of increasing the working voltage, etc., as set forth in at least col. 1 lns. 16-19 in U. S. Pat. 5,754,393.

Claims 44-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 06-216,446 in view of JP 4-175,277 A and further in view of JP 5-243,092 A and JP 2-297,915 A.

The English abstract of JP 06-216,446 discloses what appears to be at least an obvious variation of the same carbonaceous material (and method for making the same) and the same electric double layer capacitor (and method for making the same).

The carbonaceous material was prepared by:

(i) curing a phenolic resin;

(ii) grinding the cured product;

(iii) carbonizing the ground, cured product via thermal treatment in a nitrogen atmosphere, and

(iv) activating the carbonized product in an atmosphere of carbon dioxide to (evidently) obtain the carbonaceous material (please see the English abstract of JP 06-216,446, under the first two sentences under the "Constitution" paragraph header).

This activated carbonaceous material is worked up to (evidently) form the capacitor (please see the English abstract of JP 06-216,446, the last three sentences under the "Constitution" paragraph header).

The difference between the Applicants' claims and JP 06-216,446 is that Applicants' claim 44 step (1) calls for curing the resin in the presence of a *volatile component* (wherein pg. 16 lns. 11-21 in the Applicants' specification defines *volatile*

component as embracing compounds to include glycols, polyols such as ethylene glycol, etc.).

The English abstract of JP 4-175,277 A describes a method for curing phenolic resin (evidently, the same phenolic resin of JP 06-216,446 and also of Applicants' claim 47) in a process for making an electric double layer capacitor, wherein a "glycerol" or an "oxyalkylene compound" (the same polyethylene glycol embraced in the scope of compounds mentioned on pg. 16 lns. 11-21 in the Applicants' specification is *also* set forth in Tables 1 and 2 on pg. 14 in the text of JP 4-175,277 A, i. e. the "PEG") is added to the phenolic resin prior to the carbonization of the resin. The "use/advantage" section of the English abstract of JP 6-175,277 A sets forth that the product carbon composition has a high surface area (Table 3 on pg. 16 mentions a surface area as high as 1,200 m2/g, please compare this to a surface area of 1,000 to 2,500 m2/g set forth in Applicants' claim 48), liquid permeable pores (Table 3 on pg. 16 mentions a pore volume as high as 0.56 g/cm3, please compare this to the pore volume of 0.5 to 1.5 cm3/g in Applicants' claim 48) and is suitable for stably functioning capacitors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process of JP 06-216,446 A *by including* the "glycerols" or "oxyalkylene compounds" (i. e. "PEG", etc.) mentioned in the English abstract of JP 04-175,277 *with the* phenolic resin at a point in the process before the carbonization step, in the manner called for in at least Applicants' claim 44, *because* of the expected advantage of obtaining a surface area and porosity of the carbon product that renders it suitable for use in electric double layer capacitors (please see the

"use/advantage" section in the abstract of JP 4-175,277 A), *the same field of endeavor as in the Applicants' claims.*

The difference between the Applicants' claims and the English abstract of JP 06-216,446 is that (at least) Applicants' claim 44 describe temperature; viscosity and mass reduction limitations used in the process for making the carbonaceous material and capacitor, however it is submitted that these differences would have been obvious to one of ordinary skill in the art at the time the invention was made *because* the person having ordinary skill in the art is expected *to readily determine* which process parameters (i. e. the claimed temperature limitations, etc.) should be used from the general conditions of JP 06-216,446 and JP 4-175,277 A to make their carbonaceous material and capacitor *and to also describe* the chemical and physical properties of what appears to be the same carbonaceous material and capacitor.

The differences between the Applicants' claims and JP 06-216,446 is that Applicants' claims 44-46 call for the use of curing agents and curing accelerators to be used during the curing of the resin.

The English abstract of JP 2-297,915 A is drawn to the same art of making electric double layer capacitors and discloses the use of a curing agent during the curing of the phenol resin. The English abstract of JP 5-243,092 A is also drawn to the same art of making electrolytic capacitors and discloses the use of salicylic acid as an agent which shortens the aging time of components used in the manufacture of electrolytic capacitors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process of making the carbonaceous material obvious from the English abstract of JP 06-216,446 in view of JP 4-175,277 A *by including* the curing agents and/or curing accelerators disclosed in the English abstracts of JP 2-297,915 A and JP 5-243,092 A in the claimed amounts during the curing step, in the manner called for in at least Applicants' claims 44-46, *because* the disclosures set forth in the English abstracts of JP 2-297,915 A and JP 5-243,092 A are evidence that it is conventional and the status quo to use such curing agents and curing accelerators in the manufacture of capacitors. It is obvious to do what is routinely done in the art.

Note that the product resulting from the combination of the applied references is reasonably expected to inherently have the same physical properties reported in Applicants' claim 48.

Note that the same resin and the same volatile components will inherently have the same viscosities and boiling points reported in Applicants' claim 49.

Response to Arguments

The Applicants' arguments submitted in their Amendment date stamped Nov. 8, 2001, which has been filed as paper no. 7, have been fully considered but they are not persuasive.

a) *The Applicants argue that JP-446 merely describes the use of phenolic resin as the material of activated carbon, but fails to disclose whether or not the phenolic resin is liquid or solid.*

The argument is incomplete because it is not accompanied with a showing of how the argued lack of description of the physical state of the phenolic resin in JP-446 imparts a novel and/or unobvious difference between (at least) the Applicants' independent claims and JP-446.

b) *The Applicants argue that the amount and viscosity of the volatile component is also unclear.*

The difference between the Applicants' claims and JP 06-216,446 is that Applicants' claim 25 step (1) and claim 38 step (1) calls for curing the resin in the presence of a *volatile component* (wherein pg. 16 lns. 11-21 in the Applicants' specification defines *volatile component* as embracing compounds to include glycols, polyols such as ethylene glycol, etc.).

The English abstract of JP 4-175,277 A describes a method for curing phenolic resin (evidently, the same phenolic resin of JP 06-216,446 and also of Applicants' claims 29 and 42) in a process for making an electric double layer capacitor (please compare to the "electrostatic capacitance" mentioned in the English abstract of 06-216,446 and also to the "electric double layer capacitor" of Applicants' claims 31-43) wherein a "glycerol" or an "oxyalkylene compound" (the same polyethylene glycol embraced in the scope of compounds mentioned on pg. 16 lns. 11-21 in the Applicants' specification is *also* set forth in Tables 1 and 2 on pg. 14 in the text of JP 4-175,277 A, i. e. the "PEG") is added to the phenolic resin prior to the carbonization of the resin. The "use/advantage" section of the English abstract of JP 6-175,277 A sets forth that the product carbon composition has a high surface area (Table 3 on pg. 16 mentions a

surface area as high as 1200 m2/g, please compare this to the surface area of 1,000 to 2,500 m2/g set forth in (at least) Applicants' claim 17), liquid permeable pores (Table 3 mentions a pore volume as high as 0.56 g/cm3, please compare this to a pore volume of 0.5 to 1.5 cm3/g set forth in at least Applicants' claim 17) and is suitable for stably functioning capacitors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process of JP 06-216,446 A *by including* the "glycerols" or "oxyalkylene compounds" (i. e. "PEG", etc.) mentioned in the English abstract of JP 04-175,277 *with the* phenolic resin at a point in the process before the carbonization step, in the manner required by at least Applicants' claim 38, *because* of the expected advantage of obtaining a surface area and porosity of the carbon product that renders it suitable for use in electric double layer capacitors (please see the "use/advantage" section in the abstract of JP 4-175,277 A), *in the same field of endeavor as in the Applicants' claims.*

The motivation to include the "lipophilic cpd." of JP-277 with the phenolic resin of JP-446 is the expected advantage of obtaining a composition with a significantly higher capacitance (in dimensions of *farads*) as compared to a composition that was made the same way but without the "lipophilic cpd." (the Applicants' "volatile compound"), as evinced by the data set forth in Table 3 in JP-277 which show the much higher capacitances ranging from 65 to 77 farads/gram for the compositions made with the "lipophilic cpd." (i. e. DEG and/or DPG) as compared to a composition made without the

"lipophilic cpd." which showed a much lower capacitance of only 48 farads/gram. This same trend is also shown in Table 6 in JP-277.

The same volatile component will inherently have the same claimed viscosity and same claimed boiling point reported in claims 38 and 44. None of the pending claims are limited to any particular quantities of volatile component.

c) *The Applicants argue that their preferred specific surface area ranges from 600 to 1,500 m^2/g, however there is no disclosure of the ratios of the volumes of micropores, mesopores and macropores, based on the total volume of the pores and the pore volumes of the types of pores. The pore size distribution of the active carbon obtained must be different from the Applicants' carbonaceous material because the method of production disclosed in the reference (i. e. JP-446?) is different from the Applicants' method.*

In response to the Applicants' argument against the reference (JP-446?) individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The process resulting from the combination of JP-446 in view of JP-277 will *inherently* produce a product having the same claimed physical characteristics and properties.

d) *The Applicants argue that they cure their resin, and the cured material is pulverized and then carbonized, whereas in JP-446, primary activation of the*

carbonaceous material is conducted subsequent to carbonization followed by grinding of the cured product.

Applicants' claim 38 calls for (1) curing a resin; (2) pulverizing the cured product; (3) carbonizing and (4) activating, and Applicants' claim 44 calls for (1) curing a resin; (2) adding a curing agent; (3) pulverizing the cured product; (4) carbonizing and (5) activating. However, the English abstract of JP-446 discloses 1st curing the resin; (2) grinding the cured product; 3rd carbonizing the ground, cured product and 4th activating the product, therefore there is no difference in the general processing sequence.

e) *The Applicants argue that when a material is subject to carbonization, the desorption of the volatile components during the operation occurs, resulting in the formation of mesopores. If the cured product of JP-446 is carbonized, then mesopores are formed in a non-uniform manner. When the Applicants' cured product is carbonized, mesopores tend to be formed with uniformity.*

The product resulting from the combination of JP-446 in view of JP-277 will produce a product having the same inherent mesopores with the same argued uniformity, since the processes are the same. Recognizing the additional advantages and/or such latent properties (in this case, the argued uniformity of the mesopores) does not rebut the case of *prima facie* obviousness: please see the discussion of the court decisions set forth in section 2145(II) in the MPEP (8th ed.). The argument does not consider what effect JP-277 would have on the process and composition of JP-446, in the manner that JP-277 is applied in the 103 rejections.

f) *The Applicants argue that JP-277 describes the use of a liquid phenolic resin as a material to produce an activated carbon, however an evaporation-type foaming agent is mixed for treatment to form macropores having a diameter in excess of 200 Angstroms. Consequently, the pore size distribution is totally different.*

While the DWPI English abstract of JP-277 doesn't mention either the "evaporation-type foaming agent" or the "macropores having a diameter in excess of 200 Angstroms", even if this is the case for JP-277 the argued distinction does not show any unobvious difference between the "volume of macropores having diameters exceeding 200 A of not more than 15% based on the total pore volume" set forth in Applicants' claims 17 and 43 and the macropores argued to be present in JP-277.

g) *The Applicants argue that they cure their resin, pulverize the cured product followed by carbonization, whereas JP-277 carbonizes; activates and then grinds. JP-277 does not grind the cured product its self.*

The general processing sequence is already taught in JP-446: please see the 103 rejections as well as sub-paragraph (d) in this portion of the Office Action. The argument does not address the manner in which JP-277 is relied on to render obvious the addition of the glycerols and/or oxyalkylene compounds of JP-277 with the phenolic resin of JP-446 for the expected advantage of obtaining surface areas and porosities for the carbon product that would render it suitable for use in electric double layer capacitors (please see the "use/advantage" section in the English abstract of JP-277).

h) *The Applicants argue that the absorption of volatile components at the time of carbonization causes formation of mesopores and, consequently, if a cured product in*

the form of a block is carbonized, the formation of mesopores tends to be non-uniform. Alternatively, when a pulverized cured product is carbonized, the formation of mesopores tends to be uniform. If a cured product is carbonized without pulverization, hard charcoal tends to be obtained and the following pulverization is troublesome and lengthy.

The argument is not persuasive for at least the reasons set forth in sub-paragraphs (c), (d) and (e) in this portion of the Office Action.

(i) *The Applicants argue that in the process of JP-277, a formed sheet is cured and carbonized, which is used as an electrode "as is", whereas the Applicants provide an activated carbon which is formed with a binder and used as a sheet electrode.*

JP-277 is not the primary reference cited and applied in the 103 rejections. The Applicants' argument does not address the manner in which JP-277 is applied in the 103 rejections.

(j) *The Applicants argue that the Examples and Comparative Examples in the specification show that the use of the volatile component and/or curing agent produces a product having the claimed mesopore characteristics and pore volumes. The Comparative Examples 1, 2, 4 and 9, which do not have the claimed mesopore and pore volume characteristics exhibit a capacitance which is too low. These results are what the present invention seeks to avoid.*

There is nothing in at least Applicants' independent claim 38 requiring the use of the argued curing agent. Both independent claims 38 and 44 require the presence of the "volatile component" (i. e. the "glycerol" and various alkylene glycols reported on pg.

16 lns. 11-21 in the Applicants' specification) along with the resin during the preparation of the composition, however this is already taught in the English abstract of JP-277 which also discloses the presence of "lipophilic cpd" (i. e. the claimed "volatile component", the same "glycerol" and alkylene glycols reported on pg. 16 lns. 11-21 in the Applicants' specification) along with the resin during the preparation of a composition useful in electric capacitors. The motivation to include the "lipophilic cpd." of JP-277 with the phenolic resin of JP-446 is the expected advantage of obtaining a composition with a significantly higher capacitance (in dimensions of *farads*) as compared to a composition that was made the same way but without the "lipophilic cpd." (the Applicants' "volatile compound"), as evinced by the data set forth in Table 3 in JP-277 which show the much higher capacitances ranging from 65 to 77 farads/gram for the compositions made with the "lipophilic cpd." (i. e. DEG and/or DPG) as compared to a composition made without the "lipophilic cpd." which showed a much lower capacitance of only 48 farads/gram. This same trend is also shown in Table 6 in JP-277.

The composition resulting from the combination of JP-446 in view of JP-277 is expected to have the same argued mesopores, pore volumes and capacitances of the Applicants' composition.

k) *The Applicants argue that it is quite clear that pore characteristics of the present carbonaceous material are not inherent in any of the references cited by the Examiner.*

Since the claimed process is the same as the process resulting from the combination of JP-446 in view of JP-277, the pore characteristics will also be the same.

l) *The Applicants argue that in the process of JP-277, a sheet is cured and then carbonized and used as an electrode, whereas the Applicants obtain an activated carbon, and add a binder to the activated carbon to form a sheet electrode. This very material difference in process is another indicator of the non-trivial distinction between the Applicants' invention and the disclosure of JP-277.*

The general processing steps are already obvious from JP-446.

m) *The Applicants argue that the rejection of claims 17-31 and 34-43 under 35 USC 103 over JP-446 in view of JP-277 and further in view of JP-092 and JP-915 and also the rejection of claims 17-43 under 35 USC 103 over JP-446 in view of JP-277 and further in view of JP-092 and JP-915 and further in view of U. S. Pat. 5,754,393 should be withdrawn because the secondary references (i. e. JP-092, JP-915 and U. S. Pat. 5,754,393) do not correct the deficiencies of JP-446 and JP-277.*

Neither JP-446 or JP-277 are deficient for the reasons already of record.

The comment that U. S. Pat.-393 does not suggest a carbonaceous material having the pore characteristics of the Applicants' carbonaceous material is noted, but does not address the manner in which U. S. Pat.-393 is relied on to render obvious the claimed use of organic electrolytic solution comprising a solvent, as set forth in claims 32 and 33, as fairly suggested in col. 1 lns. 35-42; col. 2 lns. 34-35 and col. 2 ln. 63 to col. 3 ln. 10 in U. S. Pat.-393.

The Applicants' arguments submitted in their amendment date-stamped Aug. 22, 2003 (paper no. 13) have been fully considered but they are not persuasive.

a) *The applicants argue that the process of JP 06-216,446 shows primary activation of the carbonaceous material being conducted subsequent to carbonization and followed by grinding of the cured product into a powder. However, in the applicants' invention, the resin employed in the process is cured, and the cured material obtained is pulverized, followed by carbonization. In the applicants' process, pulverization occurs* ***before*** *carbonization and the mesopores in the carbonized product tend to be uniform. However, in the process of JP 06-216,446, the cured product is carbonized* ***without*** *pulverization and a hard charcoal in block form tends to be obtained.*

Contrary the applicants' arguments, the European patent office "Patent Abstracts of Japan" English abstract in its "Purpose" section reports that the phenolic resin is cured; the cured phenolic resin particles are ground in size, and then the ground, cured particles are carbonized - in the exact same manner that the applicants' argue is the sequence for their claimed process.

b) *The applicants argue that JP 4-175,277 A requires an evaporation-type foaming agent, which is mixed in with the resin for treatment to form macropores having diameters in excess of 200 ´. Therefore, the pore distribution of the product of JP-277 is totally different from that of the present invention.*

While the DWPI English abstract of JP-277 doesn't mention either the "evaporation-type foaming agent" or the "macropores having a diameter in excess of 200 Angstroms", even if this is the case for JP-277 the argued distinction does not show any unobvious difference between the "volume of macropores having diameters

exceeding 200 A of not more than 15% based on the total pore volume" set forth in Applicants' claims 17 and 43 and the macropores argued to be present in JP-277.

c) *The applicants argue that it is helpful to show the importance of the viscosity range (0.1 to 100 Pas.) of the present claims. The viscosities of the resins of comp. examples 1 and 2 in the present application are 0.08 Pas. and 120 Pas. (respectively). When such resins are used to prepare capacitors, the capacitor performance deteriorates in comparison to the applicants' capacitors. Additionally, the importance of the boiling point limitation for the resin of the present process ranges from 120 to 400 °C (see comp. examples 3 and 4 which use resins having a boiling point outside the claimed range). When the resulting carbonaceous material is used to prepare capacitors, the performance of the capacitors tends to be poor in comparison to capacitors of the present invention.*

The showing is incomplete because it is not accompanied with a specific showing of which claim contains the argued viscosity ranges (0.1 to 100 Pas.) and the argued boiling point limitation (120 to 400 °C) and how these claimed viscosity ranges and boiling point ranges distinguish from the those taught in the Japanese references cited and applied in the 103 rejections (to include a specific reference with a specific page and column number).

d) *The applicants argue that the examiner contends that it would have been obvious to modify the process of forming the electrode material of JP-446 by using the glycerols or oxyalkylene compounds of JP-277 into the process of JP-446. However, the resin-based formulation of the reference (JP-277?) is used to prepare a molded product and*

no such molding is employed in the process of JP-446. How would one skilled in the art consider it obvious to modify the process of JP-446 by including the components of JP-277 which are used to provide an intermediate molded product, when JP-446 does not prepare a molding as an intermediate product?

Both the process of JP-446 and JP-277 are directed to the same art of forming molded intermediates. Note that the Patent Abstracts of Japan for JP-446 reports that binder loaded carbonaceous material is molded, and also note that the English abstract of JP-277 reports that reports that the phenolic resin is hardened (which is not distinct from being "molded").

It would have been obvious to one of ordinary skill in the art at the time the invention was made *to modify* the process of JP 06-216,446 A *by including* the "glycerols" or "oxyalkylene compounds" (i. e. "PEG", etc.) mentioned in the English abstract of JP 04-175,277 *with the* phenolic resin at a point in the process before the carbonization step, in the manner called for in at least Applicants' claim 44, *because* of the expected advantage of obtaining a surface area and porosity of the carbon product that renders it suitable for use in electric double layer capacitors (please see the "use/advantage" section in the abstract of JP 4-175,277 A), *the same field of endeavor as in the Applicants' claims.*

e) *The applicants argue that the structure of the carbon material in JP-446 has a surface area ranging from 600 to 1,500 m^2/g. There is no disclosure of the ratios of the volumes of micropores, mesopores and macropores based on the total volume of the pores and pore volumes of the types of pores in the reference. The pore size*

distribution of the activated carbon material must be different from the claimed carbonaceous material of the invention because the method of production disclosed in the reference is different from the method of production of the present invention. The pore size distribution of the carbonaceous product of JP-277 is totally different from that set forth in the present claims (claim 17). How then does the combination of the two references arrive at the present invention?

The argued 600 to 1,500 m^2/g surface reported on pg. 2 col. 1 in JP-446 (actually JP 8-83,736 A) is not any different from the 1,000 to 2,500 m^2/g reported in applicants' claim 17; the 1,000 to 2,200 m^2/g reported in applicants' claim 21; the 1,000 to 1,500 m^2/g reported in applicants' claim 22; the 1,500 to 2,100 m^2/g surface area reported in applicants' claim 24; and the 1,000 to 2,500 m^2/g surface area reported in applicants' claim 31, 43 and 48.

While it is granted that JP-277 and JP-446 do not describe the ratios of the volumes of micropores, mesopores and macropores based on the total volume of the pores and pore volumes of the types of pores in the reference, but the composition manufactured according to the above process resulting from the modification of JP 6-216,446 according to JP 4-175,277 is expected to exhibit porosities that are indistinct, since the process for preparing the composition is indistinct. For example, Table 3 on pg. 16 in JP 4-175,277 mentions porosities as high as 0.56 g/cm^3, please compare this to the porosity of 0.5 to 1.5 cm^3/g set forth in (at least) Applicants' claim 17.

Since the rest of the process parameters of the carbon resulting from the process obvious from JP-446 in view of JP-277 appears to be the same (i. e. the surface areas,

the pore volumes, the porosities, etc. (please refer to the 103 rejection of at least claim 17), then it is reasonably expected that the pore size distribution will be the same, and the applicants' argument has not presented any evidence to the contrary.

f) *The applicants argue that in the process of JP-277, a formed sheet is used as an electrode "as is", whereas in the applicants' invention the carbon is formed with a binder to prepare a sheet electrode.*

The applicants' claims are drawn to a carbonaceous material; an electric double layer capacitor; a process for producing an electric double layer capacitor; and a process for producing a porous carbonaceous material, but not the argued method for preparing sheet electrodes.

g) *The applicants argue that JP-092 discloses an electrolytic capacitor, but not an electric double layer capacitor. In the electrolytic capacitor or JP-092, salicylic acid is used as the electrolyte solution and the electrodes of the electrolytic capacitor consist of aluminum foil alone with no activated carbon. Therefore, JP-092 is totally irrelevant to the present invention.*

JP-092 is drawn to the same art - capacitors. The argument did not address the manner in which JP-092 is applied to render obvious the curing agents of applicants' claims 44-46.

h) *The applicants argue that in the process of JP-915, it is not clear if the phenol resin is liquid or solid, and no viscosity information is given. These material parameters of the resin starting material employed in the present process embodiments are critical*

in obtaining the claimed carbonaceous material of the present invention. There is no suggestion of the pore size distribution of the activated carbon product obtained.

The argument does not address the manner in which JP-915 is relied on to render obvious the curing agents/accelerators of applicants' claims 44-46.

i) *The applicants argue that the rejection of claims 17-24, 29-31, 38, 42 and 43 under 35USC103 as being unpatentable over JP 06-216,446 in view of JP 4-175,277 is in error because neither of these references teach or suggest the process embodiments, or the process parameters.*

The argument does not particularly point out and distinctly set forth specifically which embodiment or process parameter that these references do not teach.

The applicants' arguments submitted in their preliminary comments date-stamped May 15, 2003 (paper no. 19) have been fully considered but they are not persuasive.

a) *The applicants argue that the declaration evidence shows that a comparison of the pore characteristics of experiment #1 in JP-446 as compared to the pore characteristics of applicants' claim 17 clearly demonstrates that the present invention is distinguished from JP-446.*

The data submitted on pg. 2 in the preliminary comments date-stamped May 15, 2003 (paper no. 19) are not surprising since none of the claims have been rejected under 35USC102 over JP-446, and the 103 rejection suggests that the process and

composition resulting from JP-446 in view of JP-277 renders obvious the limitations of the applicants' claims.

b) *The applicants argue that the pore size distribution of the carbonaceous product in the JP-227 reference is completely different from the pore size ranges set forth in claim 17 in the present application.*

Since the rest of the process parameters of the carbon resulting from the process obvious from JP-446 in view of JP-277 appears to be the same (i. e. the surface areas, the pore volumes, the porosities, etc. (please refer to the 103 rejection of at least claim 17), then it is reasonably expected that the pore size distribution will be the same, and the applicants' argument has not presented any evidence to the contrary.

c) *The applicants argue that JP-092 is completely irrelevant to the rejection because it discloses an electrolytic capacitor, not an electric double layer capacitor. In the electrolytic capacitor of JP-092, salicylic acid is used as an electrolyte solution and the electrodes of the capacitor consist of aluminum foil with no activated carbon.*

JP-092 is drawn to the same art - capacitors. The argument did not address the manner in which JP-092 is applied to render obvious the curing agents of applicants' claims 44-46.

d) *The applicants argue as to the JP-915 reference, a foaming agent is added to the phenol resin for curing, but there is no disclosure of the pore size distribution of the product activated carbon. The material parameters of the resin starting material employed in the present process are critical*

The argument does not address the manner in which JP-915 is relied on to render obvious the curing agents/accelerators of applicants' claims 44-46.

While it is granted that JP-277 and JP-446 do not describe the ratios of the volumes of micropores, mesopores and macropores based on the total volume of the pores and pore volumes of the types of pores in the reference, but the composition manufactured according to the above process resulting from the modification of JP 6-216,446 according to JP 4-175,277 is expected to exhibit porosities that are indistinct, since the process for preparing the composition is indistinct. For example, Table 3 on pg. 16 in JP 4-175,277 mentions porosities as high as 0.56 g/cm^3, please compare this to the porosity of 0.5 to 1.5 cm^3/g set forth in (at least) Applicants' claim 17.

The declaration under 37 CFR 1.132 date-stamped May 15, 2003 (paper no. 20) has been considered, but is not persuasive for the reasons set forth in sub-paragraph (a) in the rebuttal to the applicants' arguments presented in their preliminary comments date-stamped May 15, 2003 (paper no. 19).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 703-308-2540. The examiner can normally be reached on 8 hr. days.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Timothy Vanoy/tv
May 28, 2003

Timothy Vanoy
Patent Examiner

Art Unit 1754

STANLEY S. SILVERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700